



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/717,598	11/21/2003	Akio Misaka	60188-702	8679

7590 12/19/2005

Michael E. Fogarty  
McDERMOTT, WILL & EMERY  
600 13th Street, N.W.  
Washington, DC 20005-3096

EXAMINER
----------

ROSASCO, STEPHEN D

ART UNIT	PAPER NUMBER
----------	--------------

1756

DATE MAILED: 12/19/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/717,598

Applicant(s)

MISAKA, AKIO

Examiner

Stephen Rosasco

Art Unit

1756

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 27 October 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-65 is/are pending in the application.
- 4a) Of the above claim(s) 57-65 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-56 is/are rejected.
- 7) ☒ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 November 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
  - 2) ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |                                                                                                                                                       |                                                                                         |
|-------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                                                           | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                                                  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>9/8/05, 11/21/03</u> . | 6) <input type="checkbox"/> Other: _____                                                |

### Detailed Action

Applicant's election without traverse of Group I (claims 1-56) in the reply filed on 10/27/05 is acknowledged.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-3 and 26 are rejected under 35 U.S.C. 102(b) as being anticipated by Yasuzato et al. 6,355,382.

Yasuzato et al. teach a photomask in which contrast of light intensity of a pattern to be transferred (main pattern) is enhanced on an image plane while transfer of the auxiliary pattern themselves is suppressed. The photomask, which is used in exposure to which is applied four-point illumination method for inverting phase of light that passes through mutually adjacent patterns, has first auxiliary patterns, disposed above and below and to the left and right of a main pattern to be transferred, to thereby provide a transparent substrate with a surface flush with the main pattern or with a difference in level corresponding to a phase difference with respect to the main pattern that is  $K$  times 360degree (where  $K$  is an integer that does not include zero), and second auxiliary patterns disposed at angles of 45.degree. with respect to the main pattern, the second auxiliary patterns providing a difference in level corresponding to a phase difference, with respect to the first auxiliary patterns, that is  $(2L+1)$  times 180.degree. (where  $L$  is an integer inclusive of zero). The contrast of the first auxiliary patterns is reduced by the second auxiliary patterns, thereby enlarging the depth of focus.

Art Unit: 1756

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

Claims 1-56 are rejected under 35 U.S.C. 102(a) as being clearly anticipated by Misaka (EP 1241523 A1).

The applicant is the inventor on this reference, which has an earlier date. It teaches all of the claimed limitations.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-56 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yasuzato et al. (6,355,382) in view of Misaka (EP 1241523 A1).

The claimed invention is directed to a photomask comprising: a mask pattern formed on a transparent substrate; and a transparent portion of said transparent substrate where said mask pattern is not formed, wherein said mask pattern includes a main pattern to be transferred through exposure and an auxiliary pattern that diffracts exposing light and is not transferred through the exposure, said main pattern is composed of a first semi-shielding portion that has first transmittance for partially transmitting said exposing light and transmits said exposing light

Art Unit: 1756

in an identical phase with respect to said transparent portion, and a phase shifter that transmits said exposing light in an opposite phase with respect to said transparent portion, and said auxiliary pattern is made from a second semi-shielding portion that has second transmittance for partially transmitting said exposing light and transmits said exposing light in the identical phase with respect to said transparent portion.

And wherein said first transmittance is 15% or less.

And wherein said second transmittance is not less than 6% and not more than 50%.

Yasuzato et al. teach a photomask in which contrast of light intensity of a pattern to be transferred (main pattern) is enhanced on an image plane while transfer of auxiliary pattern themselves is suppressed. The photomask, which is used in exposure to which is applied four-point illumination method for inverting phase of light that passes through mutually adjacent patterns, has first auxiliary patterns, disposed above and below and to the left and right of a main pattern to be transferred, to thereby provide a transparent substrate with a surface flush with the main pattern or with a difference in level corresponding to a phase difference with respect to the main pattern that is  $K$  times 360 degree (where  $K$  is an integer that does not include zero), and second auxiliary patterns disposed at angles of 45 degree. with respect to the main pattern, the second auxiliary patterns providing a difference in level corresponding to a phase difference, with respect to the first auxiliary patterns, that is  $(2L+1)$  times 180 degree. (where  $L$  is an integer inclusive of zero). The contrast of the first auxiliary patterns is reduced by the second auxiliary patterns, thereby enlarging the depth of focus.

The teachings of Yasuzato et al. differ from those of the applicant in that the applicant teaches specific transmittances and exposure conditions.

Art Unit: 1756

Misaka teaches these limitations and the benefits of adjusting the transmittances and exposure conditions.

Therefore it would have been obvious to one having ordinary skill in the art to take the teachings of Yasuzato et al. and combine them with the teachings of Misaka in order to make the claimed invention because it would be obvious to one to modify the teachings of Yasuzato et al. based on the benefits described by Misaka.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Stephen Rosasco whose telephone number is (571) 272-1389. The Examiner can normally be reached Monday-Friday, from 8:00 AM to 4:30 PM. The Examiner's supervisor, Mark Huff, can be reached on (571) 272-1385. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to read 'S. Rosasco', with a stylized, sweeping flourish extending from the end.

S. Rosasco  
Primary Examiner  
Art Unit 1756

S. Rosasco  
12/01/05